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Assessment of hypercoagulability in asymptomatic patients with antiphospholipid antibodies

Emilia Krzemińska
Jacek Treliński

Department of Hemostasis Disorders, Medical University of Lodz

Introduction

In recent years, special attention has been paid to the correlation between antiphospholipid antibodies (APL) and thromboembolic events. Numerous studies in this field have shown that APL may contribute to the development of both venous and arterial thrombosis and recurrent obstetric complications, which defines the so-called antiphospholipid syndrome. Although in recent years significant progress has been made in understanding the APL mechanisms of action, no clear answer to the question, why only some patients develop thromboembolic complications, was obtained. So far, no large-scale analysis of laboratory parameters related to hemostasis processes has been conducted in individuals with APL.

Aim of the study

The aim of the study was a preliminary analysis of the hemostatic screening tests results in a group of asymptomatic APL-positive individuals and identification of possible laboratory parameters that may increase the risk of thromboembolic episodes in these patients. In the long term, such studies may provide the basis for determining risk groups of thrombotic complications and thus allow for the early implementation of appropriate antithrombotic prophylaxis in the most at-risk patients.

Materials and methods

The study group consisted of 31 patients aged 25 to 80 (median age 67), including 27 women and 4 men, with confirmed antiphospholipid antibodies presence and negative history of thromboembolic complications. The control group consisted of 15 people aged 28 to 84 (median age 50), including 12 women and 3 men, tested negative for APL and with no history of thrombosis.

As part of the experiment, basic coagulation tests were performed, including: complete blood count with platelet count (PLT), prothrombin time (PT), activated partial thromboplastin time (APTT), fibrinogen concentration (FBG), and, additionally, ROTEM thromboelastometry. The material for all tests was peripheral blood collected in the morning on an empty stomach.

The material for the ROTEM thromboelastometry consisted of uncentrifuged whole blood samples collected on sodium citrate 3.2% in a ratio of 1:9. Determination was performed using the ROTEM® delta analyzer with PentapharmGmbH, Munich, Germany, v. 1.5.3. software. As part of the ROTEM study, 4 tests were performed: EXTEM, INTEM, FIBTEM and APTEM. In each test, the same parameters reflecting the dynamics of clot formation and fibrinolysis, were evaluated: clotting time (CT), clot formation time (CFT), alpha-angle, maximum clot firmness (MCF), lysis index (LI 30/45/60) and maximum lysis (ML).

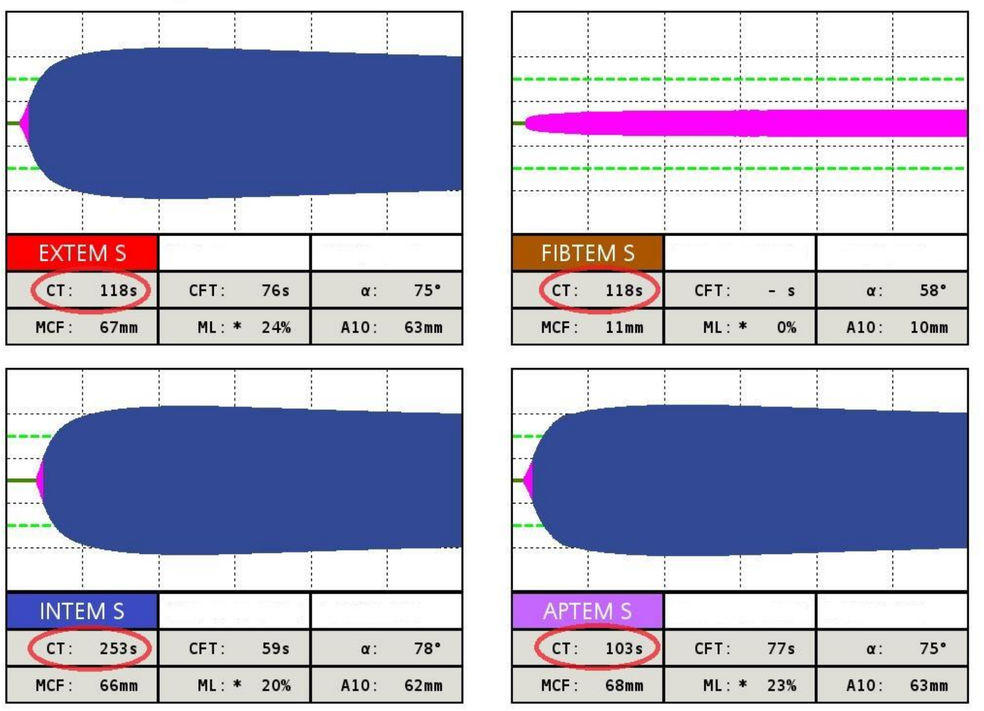

Figure 1. Prolonged clotting time (CT) in EXTEM, INTEM, FIBTEM and APTEM in APL-positive patient.

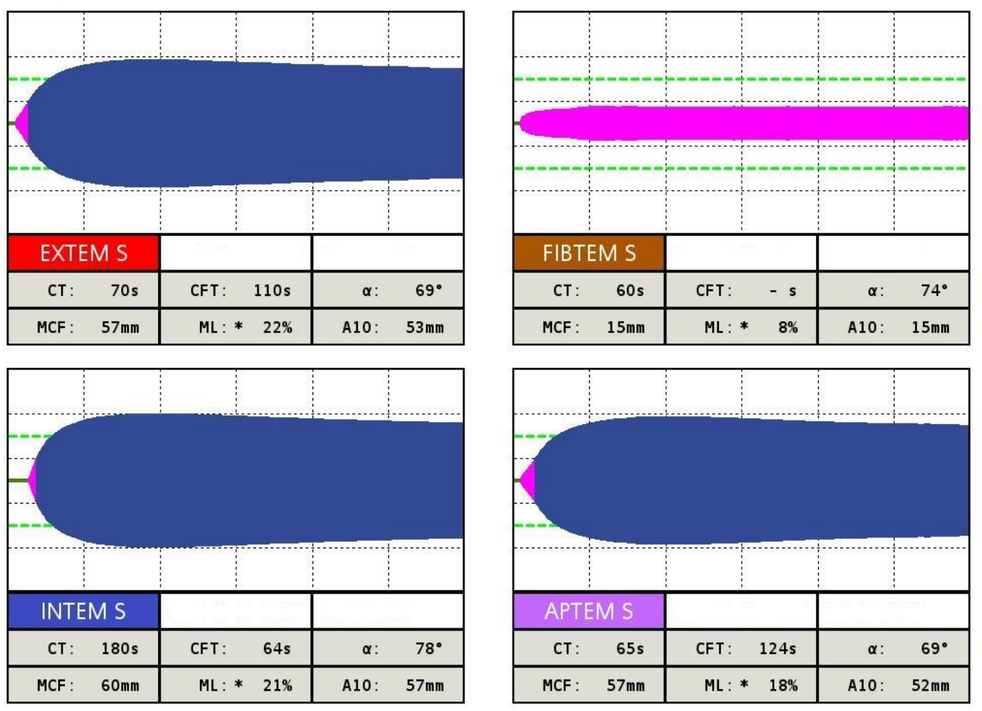

Figure 2. Normal clotting time (CT) in EXTEM, INTEM, FIBTEM and APTEM in APL-negative patient.

Results

APTT values were found to be significantly higher in the study group than in the control group ($p<0.001$). Interestingly, also PT values were markedly higher in APL-positive patients compared to the controls ($p=0.036$). However, no significant differences in WBC, HGB, HCT, PLT and FBG values were observed between the studied groups. Analyzing the ROTEM thromboelastometry results, all: EXTEM ($p=0.003$), INTEM ($p<0.001$), FIBTEM ($p<0.001$) and APTEM ($p=0.015$) tests found CT readings to be significantly higher in patients with APL (Fig. 1) compared to the controls (Fig. 2). Moreover, CFT values were markedly lower in the study group ($p=0.038$) according to the APTEM test. No marked differences were found between the analyzed groups regarding other ROTEM thromboelastometry parameters.

Conclusions

Analyzing preliminary results of the research, it can be concluded that the presence of antiphospholipid antibodies correlates with the occurrence of prolonged coagulation times. Also, APL-positive individuals may have changes in ROTEM thromboelastometry parameters that indicate abnormalities in the initial stages of clot formation. Further analysis of laboratory parameters related to the processes of hemostasis in this group of patients seems to be justified, as it may contribute not only to expanding knowledge about the APL mechanisms of action, but also to identifying factors that predispose some of the patients to thrombosis development.